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## A PRELIMINARY REPORT ON ANTHROPOMETRY IN THE UNITED STATES.

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The writer has adopted the above title for this paper since his chief purpose, at this time, is to call attention to the number and variety of the publications which relate to anthropometry in the United States, without attempting a complete or critical analysis of any of them. It is also proper to note that the appended Provisional List includes several titles of books and articles which have been published in Europe by American writers, and a few titles of articles relating to anthropometry in America by European writers.

In this paper the term anthropometry is used in the sense originally attributed to it by Quetelet, which includes the measure of the different faculties of the human being; although anthropometrical study in the United States has been pursued, for the most part, for the sake of determining the physical proportions of the body and its parts.

Considered as a whole, the American literature on anthropometry consists largely of descriptive and tabulated reports of the results reached by individual observers in comparatively narrow and disconnected fields of investigation. A very considerable amount of material has been amassed, but much of it is so heterogeneous as to remind one of a heap of nuggets of crude ores of different kinds, which, to yield true metal, must needs be sorted, roasted, and refined. Nevertheless, in spite of some vagueness of aim and considerable diversity of methods, a sufficient amount of valuable material has been published in relation to the growth and development of children and adolescents to warrant an earnest and laborious attempt to sift, collate, and recast it in such wise as to make it available for the purposes of the vital statistician,

the biologist, the psycho-physicist, and even the routine educationist. It is clearly the part of wisdom to utilize the material at present in hand, partly in order that its actual value may be ascertained, and partly because a comprehensive and searching study of it would serve to indicate what problems should be attacked next, and to suggest the most hopeful means of attack in such problems.

That the study of anthropometrical problems has become more extensive and diversified recently is rendered evident by comparing the number and variety of the titles of works published since 1880, or even since 1890, with those published between 1850 and 1880. (See appended Provisional List.) It is noteworthy, moreover, that interest in the physiological and psycho-physical bearings of anthropometrical science is steadily increasing. [See the articles by Bolton (7), Bryan (12), Burnham (13), Gilbert (15), Porter (22), Scripture (26), and West (31) cited below].

As regards amount of statistical data and the discussion of theoretical questions, the weightiest contributions to anthropometrical science in America have been made in the department of Military Anthropometry by Messrs. Elliott (55), Gould (57), and Baxter (52). Next in rank, in the order named, are the departments of Anthropometry of School Children (see Bowditch, 8, 9, and 10; Peckham, 20 and 21; Porter, 22-25; and Boas, 5 and 6); and the Anthropometry of Students (see Hitchcock, 91-102; Sargent, 106-109; Enebuske, 88 and 89; and Wood, 113-117). The papers of Beyer (53), Enebuske (88 and 89), and Porter (22) give evidence of a growing tendency to attempt to correlate the results of anthropometrical investigations, and the teachings of physiology as to the development of functional power. In the field of criticism and discussion of methods the articles of Boas (34), Gulick (38), and Porter (47) mark a new and hopeful departure. Minot's paper (45) is a valuable contribution to the theory of growth. Spiess, of Frankfurt am Main, and Geissler and Ulitzsch, in Saxony, measured large

numbers of school children, in respect to height, in order to determine the normal dimensions of desks and seats to be used in school by the children in question. It would appear that no investigations of this sort, worthy of mention, have been made as yet in this country.

Dr. Bowditch's papers are of capital importance, by reason of the light they throw on the law of growth, and the significance of the physical changes incident to puberty. Their bearing upon school management has not been sufficiently recognized as yet by school authorities in this country. Dr. Bowditch is now generally credited with being the first to show that boys and girls have different rates of growth, as regards height and weight; and his observations and conclusions have been strikingly corroborated by Peckham, Porter, and West in the United States, and by the investigations of a Royal Commission in Denmark, by Roberts in England, Pagliani in Italy, Erismann in Russia, Geissler and Ulitzsch in Saxony, and by Axel Key in Sweden.

The writer, who is at present engaged in making a comparative study of mortality and growth rates, finds that there is a striking relation between the death rates of Boston boys and girls and their respective rates of growth, as determined by Bowditch. That is to say, the death rates of Boston boys are lowest during the period of their most rapid growth, and the death rates of Boston girls are lowest during their period of most rapid growth. He also finds that a similar relation exists between the death and growth rates of Swedish boys and girls. The results of the writer's investigations touching this question will be published shortly in the *Quarterly Publications of the American Statistical Association*.

The use of anthropometry as a means for guiding and testing procedures in physical training is becoming general in the leading colleges for men and women, and in a few secondary and special schools, and in the Y. M. C. A. Herein is found one of the most characteristic developments of anthropometry in America. In this connection, special mention

should be made of the life size "anthropometric statues" exhibited by Dr. Sargent in the Anthropological Department of the Columbian Exposition, since they constitute a unique and highly interesting contribution to anthropometry. They are intended to represent the bodily proportions and conformation of the typical college man and college woman, and are based on extensive unpublished data belonging to Dr. Sargent. The Bertillon anthropometrical system, for the identification of criminals, has been adopted by a few penal institutions. Extensive anthropometrical investigations have recently been made upon American Indians under the supervision of Dr. Franz Boas. The results of Dr. Boas's studies remain to be published. The amount of undigested and unpublished material in military, prison, school, and college anthropometry is now very extensive, and increases yearly.

Hitherto American anthropometrists, as a rule, have worked too much apart from one another, along short lines, and within comparatively narrow limits. It is time to attempt to bring about a closer organization, one that shall conduce to unity of purpose and intelligent coöperation in the field of investigation, and to the adoption of the most approved scientific methods of recording, collating, and publishing the results of such investigations. Such an organization should also seek to keep heartily and thoroughly in touch with the anthropometrists of Europe. It is to be hoped that the recent establishment of special committees on anthropometry by the International Statistical Institute, and of the American Statistical Association, respectively, will tend to promote a more vigorous and intelligent prosecution of anthropometrical studies on both sides of the Atlantic.

PROVISIONAL LIST OF WORKS —ARTICLES, BOOKS, AND TABLES —  
RELATING TO ANTHROPOMETRY IN THE UNITED STATES, INCLUDING 117 TITLES, ARRANGED IN CLASSES I-VI.

Class I, Nos. 1-3, titles relating to Art.

Class II, Nos. 4-33, titles relating to Anthropometry of Children.

Class III, Nos. 34-51, titles relating to Methods in Anthropometry.

Class IV, Nos. 52-58, titles relating to Military and Naval Anthropometry.

Class V, Nos. 59-85, titles relating to Miscellaneous Topics in Anthropometry.

Class VI, Nos. 86-117, titles relating to Anthropometry of Students.

ANALYSIS OF TITLES ACCORDING TO DATE OF PUBLICATION AND CLASS OF SUBJECT.

	1. Art.	2. Children.	3. Methods.	4. Military.	5. Miscellaneous.	6. Students.	Total.
Period 1850-60	0	0	0	1	2	0	3
Period 1860-70	1	0	0	2	4	1	8
Period 1870-80	1	3	0	1	2	0	7
Period 1880-90	1	8	8	1	8	10	36
Period 1890-94	0	19	10	2	11	21	63
Sum .....	3	30	18	7	27	32	117

CLASS I. TITLES RELATING TO ART.

1. ALLEN, H. *An Analysis of the Life-Form in Art.* Philadelphia, 1875. 4to.
2. FLETCHER, R. *Human Proportion in Art and Anthropometry.* A lecture delivered at the National Museum, Washington, D. C. Cambridge, 1883. M. King. 37 p. 4 pl. 8vo.
3. STORY, W. W. *The Proportions of the Human Figure, According to a New Canon, for Practical Use: with a Critical Notice of the Canon of Polycletus, and of the Principal Ancient and Modern Systems.* London, 1866. 8vo.

## CLASS II. TITLES RELATING TO ANTHROPOMETRY OF CHILDREN.

4. ABBOTT, S. W. *The Evidence of Still-Birth*. Transactions of Massachusetts Medico-Legal Society. I. 56. Boston, 1879.  
Relates to length and weight of infants at birth.
5. BOAS, F. *Anthropological Investigations in Schools*. Pedagogical Seminary, Worcester, Mass., 1891. I. 225-228. Also in *Science*, New York, 1891. Vol. xvii, 351-352.
6. ——— *The Growth of Children*. *Science*. New York, 1892. Vol. xix, 256; 281-282; xx, 351-352.
7. BOLTON, T. L. *The Growth of Memory in School Children*. American Journal of Psychology. 1892. Vol. iv, 189-192; 362-380.
8. BOWDITCH, H. P. *The Growth of Children*. Report of Board of Health of Massachusetts. Boston, 1877. Vol. viii. 51 p., 10 tables.
9. ——— *The Growth of Children: a Supplementary Investigation, with Suggestions in Regard to Methods of Research*. Report of Board of Health of Massachusetts. Boston, 1879. Vol. x. 33-62. 11 pl.
10. ——— *The Growth of Children. Studied by Galton's Method of Percentile Grades*. Report of Board of Health of Massachusetts, 1889-90. Boston, 1891. Vol. xxii. 479-522.
11. ——— *The Relation between Growth and Disease*. Reprinted from Transactions of the American Medical Association. Philadelphia, 1881. 9 p.
12. BRYAN, W. L. *On the Development of Voluntary Motor Ability*. American Journal of Psychology. Worcester, 1892. Vol. v. 125-204. 3 charts.
13. BURNHAM, WM. H. *A Scheme of Classification for Child-Study*. Pedagogical Seminary. Worcester, Mass., 1893. Vol. ii. 191-198.
14. CHAILLE, S. E. *Infants: their Chronological Progress*. New Orleans Medical and Surgical Journal, 1886-87. N. S. Vol. xiv. 893-912. Also reprint.
15. GILBERT. *Experiments on the Musical Sensitiveness of School Children*. Studies from the Yale Psychological Laboratory. 1892-93. 80-87.
16. GREENWOOD, J. M. *Heights and Weights of Children*. American Public Health Association Report, 1891. Concord, N. H., 1892. Vol. xvii. 199-204.

17. HINDS, CLARA BLISS. *Child Growth*. Reprint of paper before Women's Anthropological Society of Washington. Washington, D. C., 1886. 8 p.
18. MOON, S. B. *Measurements of the Boys of the McDonogh School for the Years 1888-1891: arranged in Order of Height, Summed and Averaged. Also a Percentile Table for 115 Boys 13-14 Years of Age*. McDonogh, Maryland, 1892. 46 p. 4to.
19. MORSE, W. H. *The Baby's Growth*. Virginia Medical Monthly. Richmond, 1886-87. Vol. xiii. 392-395.
20. PECKHAM, GEORGE W. *The Growth of Children*. Report Wisconsin Board of Health, 1881. Madison, 1882. Vol. vi. 28-73. 2 pl. 12 diag.
21. ——— *Various Observations on Growth*. Ibid, 1882. Madison, 1883. Vol. vii, 185-188.
22. PORTER, W. T. *The Growth of Saint Louis Children*. Transactions of the Academy of Science of St. Louis, 1894. In press.
23. ——— *The Physical Basis of Precocity and Dullness*. Transactions of the Academy of Science of St. Louis. St. Louis, 1893. Vol. vi. 161-181.
24. ——— *The Relation between the Growth of Children and their Deviation from the Physical Type of their Sex and Age*. Transactions of the Academy of Science of St. Louis. St. Louis, 1893. Vol. vi. 233-250. 8 tables. 1 diag.
25. ——— *Ueber Untersuchungen der Schulkinder auf die Physischen Grundlagen ihrer geistigen Entwicklung*. Read in Berliner Gesellschaft für Anthropologie, Ethnologie, und Urgeschichte, 15 July, 1893. Zeitschrift für Ethnologie. Berlin, 1894. 337-354.
26. SCRIPTURE, E. W. *Tests on School Children*. Educational Review. New York, 1893. Vol. I. 52-61.
27. STOCKTON-HOUGH, J. *Statistics Relating to Seven Hundred Births (White) Occurring in the Philadelphia Hospital, between 1865 and 1872*. Philadelphia Medical Times, 1885-86. Vol. xvi. 92-94.
28. WEST, G. M. *Anthropometrische Untersuchungen über die Schulkinder in Worcester, Mass.* Archiv für Anthropologie. Braunschweig, July, 1893. Vol. xxii. 13-48; 23 tables; 5 diag.
29. ——— *The Anthropometry of American School Children*. Proceedings of the International Congress. Chicago, 1893. In press.



30. ——— *The Anthropometry of Japanese School Children.* In press.
31. ——— *Eye-Tests on School Children.* American Journal of Psychology. 1892. Vol. iv. 595–596.
32. ——— *The Growth of the Breadth of the Face.* Science. New York, 1891. Vol. xviii. 10–11.
33. ——— *Worcester (Mass.) School Children; the Growth of the Body, Head, and Face.* Science. New York, 1893. Vol. xxi. 2–4.

CLASS III. TITLES RELATING TO METHODS IN ANTHROPOMETRY.

34. BOAS, F. *The Theory of Anthropometrical Statistics.* Paper read September 16, 1893, before the International Statistical Institute, at Chicago. Quarterly Publications of the American Statistical Association. Boston, Dec., 1893.
35. GALTON, FRANCIS. *Useful Anthropometry.* Proceedings of the American Association for Advancement of Physical Education, 1891. Ithaca, N. Y., 1891. Vol. vi. 51–57.
36. GIHON, A. L. *Physical Measurements.* Wood's Reference Hand-book of the Medical Sciences. New York, 1887. Vol. v. 667–673.
37. GREENLEAF'S, DR., *New Table of Physical Proportions.* Baltimore Underwriter. 1890. Vol. xliii. 303.
38. GULICK, L. *Manual for Physical Measurements, in Connection with the Y. M. C. Association Gymnasium Records.* New York, 1892.
39. ——— *The Value of Percentile Grades.* Quarterly Publications of the American Statistical Association. Boston, 1893. N. S. Nos. 21, 22. 321–331.
40. HITCHCOCK, E., JR. *Physical Measurements, Fallacies, and Errors.* Proceedings American Association for Advancement of Physical Education, 1887. Brooklyn, N. Y., 1887. Vol. iii. 35–42.
41. HOLGATE, T. H. *An Instrument for Measuring the Lower Extremities Correctly.* Medical Record. New-York, 1881. Vol. xx. 164.
42. HURD, KATE C. *Some of Galton's Tests Concerning the Origin of Human Faculty.* Proceedings American Association for Advancement of Physical Education, 1891. Ithaca, N. Y., 1891. Vol. vi. 80–96.

43. JACKSON, W. A. J., JR. *Graphic Methods in Anthropometry*. Physical Education. Springfield, Mass., 1893. Vol. ii. 89-94.
44. KELLOGG, J. H. *A New Dynamometer for Use in Anthropometry*. Battle Creek, Michigan, 1893. No imprint.
45. MINOT, C. S. *Growth*. Reference Hand-book of the Medical Sciences. New York, 1886. Vol. iii. 394-400.
46. MULLER, G. *Alphonse Bertillon's Method for the Identification of Criminals*. Anthropometric Identifications. Adopted by the Wardens' Association for the Registration of Criminals, at their meeting in Toronto, September, 1887. Instructions for taking measurements and descriptions. Translated from the French by Gallus Muller, Clerk of the Illinois State Penitentiary. Joliet, Ill., 1887. 84 p. 8vø.
47. PORTER, W. T. *On the Application to Individual School Children of the Means Derived from Anthropological Measurements by the Generalizing Method*. Paper read September 16, 1893, before the International Statistical Institute, at Chicago. Quarterly Publications of the American Statistical Association. Boston, Dec., 1893.
48. SARGENT, D. A. *Report on Anthropometric Measurements. A Schedule of Measurements with Directions for Making Them*. Presented by a Committee of the A. A. A. P. E., through its Chairman, Dr. Sargent, and adopted by the Association, November 26, 1886. Proceedings American Association for Advancement of Physical Education, 1886. Brooklyn, N. Y., 1886. Vol. ii. 6-15.
49. ——— *Anthropometric Apparatus, with Directions for Measuring and Testing the Principal Physical Characteristics of the Human Body*. Cambridge, Mass., 1887. 8vo.
50. SEAVER, J. W. *Anthropometry and Physical Examination. For Practical Use in Connection with Gymnasium Work and Physical Education*. New Haven, 1890. 127 p.
51. SWAIN, F. *Anthropometric Measurements*. Proceedings American Association for Advancement of Physical Education, 1887. Brooklyn, N. Y., 1887. Vol. iii. 43-50.

CLASS IV. TITLES RELATING TO MILITARY AND NAVAL ANTHRO-  
POMETRY.

52. BAXTER, J. H. *Statistics, Medical and Anthropological, of the Provost-Marshall-General's Bureau, Derived from Records of the*

*Examination for the Military Service in the Armies of the United States During the Late War of the Rebellion of over a Million Recruits, Drafted Men, Substitutes, and Enrolled Men.* Compiled under direction of the Secretary of War. 2 vols. 4to. Washington, D. C., 1875.

53. BEYER, H. G. *Observations on Normal Growth and Development of the Human Body Under Systematized Exercise.* Report of Surgeon-General of the U. S. Navy, 1893. Washington, D. C., 1893. 141-160. 16 tables in text.
54. COOLIDGE, R. H. *Statistical Report on the Sickness and Mortality of the Army of the United States, Compiled from the Records of the Surgeon-General's Office, from January, 1839, to January, 1855.* Washington, D. C., 1856.
55. ELLIOTT, E. B. *On the Military Statistics of the United States of America.* Printed for the United States Sanitary Commission. Berlin, 1863. 44 p. 2 pl. 4to.
56. GIHON, A. L. *A Study of Adolescent Growth, Based on the Physical Examination of 6129 Naval Cadets and Candidates for Appointment as Cadets, and 2058 Naval Apprentices.* Report of the Surgeon-General United States Navy. Washington, D. C., 1880. 15-44.
57. GOULD, B. A. *Investigations in the Military and Anthropological Statistics of American Soldiers.* U. S. Sanitary Commission. New York, 1869. 655 p. 8vo.
58. STERNBERG, GEORGE M. *Physique of Accepted Recruits and Re-enlisted Men (U. S. Army), 1892.* Report of the Surgeon-General of the Army to the Secretary of War, 1893. Washington, D. C., 1893. 20; 226-227.

Table xxv gives average height, weight, and chest measure of 9585 recruits (8555 white, 833 colored, 197 Indian).

#### CLASS V. TITLES RELATING TO MISCELLANEOUS TOPICS IN ANTHROPOMETRY.

59. BEARD, G. M. *English and American Physique.* North American Review. New York, 1879. Cxxxix. 588-603.
60. BOAS, F. *Physical Characteristics of the Indians of the North Pacific Coast.* American Anthropologist. 1891. Vol. iv. 25-32.
61. BOWDITCH, H. P. *On the Collection of Data at Autopsies.* A report presented to the Massachusetts Medico-Legal Society, February 1, 1882. Reprint. No imprint.

62. ——— *The Physique of Women in Massachusetts*. Report of Board of Health of Massachusetts, 1889. Boston, 1890. Vol. xxi. 287–304. 1 table. Also reprint.
63. BRADFORD, E. H. *The Effect of Recumbency on the Length of the Spine*. Boston Medical and Surgical Journal. 1883. Vol. cix. 245.
64. BRINTON, D. G. *External Mensuration of the Human Subject*. Medical and Surgical Reporter. Philadelphia, 1869. Vol. xx. 1–2.
65. CORDEIRA, F. J. B. *A Contribution to Anthropometry*. New York Medical Journal. New York, 1887.
66. DICKSON, S. H. *Statistics of Height and Weight in the South*. Charleston Medical Journal and Review, 1857. Vol. xii. 607–613.
67. ——— *Some Additional Statistics of Height and Weight*. Ibid. 1858. Vol. xiii. 494–506.
68. ——— *Statistics of Height and Weight*. American Journal of Medical Sciences. Philadelphia, 1866. N. S. Vol. lii. 373–380.
69. DUN, W. A. *The Police Standard of Cincinnati; with some Statistics Compiled from the First Thousand Examinations of Applicants*. Cincinnati Lancet-Clinic, 1887. N. S. Vol. xviii. 131–135; 767–769.
70. FRENCH, M. S. *Report of the Physical Examination of Men upon the Police Force of Philadelphia, and those who were Applicants for Appointment*. Philadelphia, 1885.
71. HARTWELL, EDWARD M. *Preliminary Report on Anthropometry in the United States. With Provisional List of Works Relating to Anthropometry in the United States*. Paper read before the International Statistical Institute at Chicago, September 16, 1893. Quarterly Publications of the American Statistical Association. Boston, Dec., 1893.
72. HURD, KATE C. *On Anthropometry*. Times and Register. New York and Philadelphia, 1890. Vol. vii. 506–511.
73. KELLOGG, J. H. *Outline Studies of the Human Figure, Comprising 118 Figures which Embody the Results of Several Thousand Observations, Embracing Studies of a Number of Different Civilized and Uncivilized Races*. Modern Medicine Publishing Co. Chicago, London, and Battle Creek, Mich., 1893.

74. ——— *Physical Chart, Arranged from Results Obtained in Testing the Strength of Individual Groups of Muscles in 200 Men, Ages 18–30 Years, by Means of Dr. Kellogg's Mercurial Dynamometer.* Battle Creek, Mich., 1893.
75. ——— *Physical Chart, Arranged from the Results Obtained in Testing the Strength of the Individual Groups of Muscles in 600 Men by Means of a Universal Mercurial Dynamometer.* Battle Creek, Mich., 1893.
76. ——— *Physical Chart, Arranged from the Results Obtained from Testing the Strength of the Individual Groups of Muscles in 600 Women by Means of a Universal Mercurial Dynamometer.* Battle Creek, Mich., 1893.
77. ——— *Table of Strength Measurements, Arranged from the Measurements of 100 Adult Women.* Battle Creek, Mich., 1891.
78. ——— *Table of Strength Measurements, Arranged from the Measurements of 100 Adult Men.* Battle Creek, Mich., 1891.
79. LEE, C. A. *A Table Showing the Physical Characteristics of the Members of the United States Senate.* First Session 39th Congress. Buffalo Medical and Surgical Journal, 1866–67. Vol. vi. 390–396.
80. MORRIS, M. *Biometry: its Relation to the Practice of Medicine.* Medical Record. New York, 1875. Vol. x. 481–486.
81. RUSCHENBERGER, W. S. W. *Contributions to the Statistics of Human Growth.* American Journal of Medical Sciences. Philadelphia, 1867. N. S. Vol. liii. 67–70.
82. SARGENT, D. A. *The Physical Development of Women.* Scribner's Magazine, February, 1889. Vol. v. 172–185.
83. TITCHENER, E. B. *Anthropometry and Experimental Psychology.* Philosophical Review. Boston, New York, and Chicago, 1893. Vol. ii. 187–192.
84. WEST, G. M. *The Anthropometry of North American Mulattoes.* In press.
85. WILKINS, W. W. *Comparative Measurements of the Chest.* Transactions of New Hampshire Medical Society. Manchester, N. H., 1886. 125–130.

CLASS VI. TITLES RELATING TO ANTHROPOMETRY OF STUDENTS.

86. ALLEN, N. *Physical Culture in Amherst College.* 8vo. Lowell, 1869.

87. ANDERSON, W. G. *Students in Gymnasium*. Adelphian. Brooklyn, 1885. Vol. v. No. 1. 10.
88. ENEBUSKE, CLAËS J. *An Anthropometrical Study of the Effects of Gymnastic Training on American Women*. Paper read September 16, 1893, before the International Statistical Institute, at Chicago. Quarterly Publications of the American Statistical Association. Boston, Dec., 1893.
89. ——— *Some Measurable Results of Swedish Pedagogical Gymnastics*. Proceedings of American Association for Advancement of Physical Education, 1892. Springfield, Mass., 1893. Vol. vii. 207–235. 8 tables in text.
90. HANNA, DELPHINE. *Anthropometric Tables, Compiled from the Measurements of 1600 Women (Oberlin Students), Department of Physical Training Oberlin College*. Oberlin, Ohio, 1893. No imprint.
91. HITCHCOCK, E. *An Anthropometric Study of the Students of Amherst College, Constructed upon Bodily Stature as the Basis of Comparison*. Second edition. 1893. No imprint. Contained also in No. 102.
92. ——— *Average and Mean Anthropometric Data of Amherst College Students*. 1888. 8vo. No imprint.
93. ——— *Comparative Study of Measurements of Male and Female Students at Amherst, Mount Holyoke, and Wellesley Colleges, U. S. A.* Physique. London, 1891. Vol. i. 90–94. Also in Proceedings of American Association for Advancement of Physical Education. Ithaca, N. Y., 1891. Vol. vi. 37–42.
94. ——— *The Distribution of Physical Measurements Shown in the Different Years of College Life*. Amherst College. 1892. No imprint.
95. ——— *The Gain in Physical Strength of College Students*. Two tables. Amherst, 1892. No imprint.
96. ——— *Physical Growth of Amherst Students. Gain Between Freshman and Senior Years*. 1892. No imprint.
97. ——— *The Results of Anthropometry as Derived from the Measurements of the Students in Amherst College*. Amherst, Mass., 1892. 7 p. 6 tables. 8vo.
98. ——— *Summary of Anthropometrical Studies of the Students of Amherst College*. Paper read September 16, 1893, before the

International Statistical Institute, at Chicago. Quarterly Publications of the American Statistical Association. Boston, Dec., 1893.

99. HITCHCOCK, E., JR. *A Synoptic Exhibit of 15,000 Physical Examinations.* Made on male college students. Ithaca, N. Y., 1890.

For summary of averages shown graphically in above table see Proceedings of American Association for Advancement of Physical Education, 1890. Ithaca, N. Y., 1890. Vol. v. 5.

100. — *Report on Physical Culture to the President of Cornell University.* Contains two tables showing the standing in scholarship of Cornell oarsmen, base-ball men, and members of athletic teams; and seven synoptic anthropometric charts. See Appendix II. Annual Report of the President of Cornell University for 1887–88. Ithaca, N. Y., 1888. 111–125.
101. HITCHCOCK, E., and SEELYE, H. H. *An Anthropometric Manual, giving the Average and Mean Physical Measurements and Tests of Male College Students, and Modes of Securing them.* Prepared from the Records of the Department of Physical Education and Hygiene in Amherst College during the Years 1861–62 and 1887–88, inclusive. 2nd ed. Amherst, Mass., 1889. J. E. Williams. 37 p. 1 table. 8vo.
102. — *An Anthropometric Manual giving Physical Measurements and Tests of Male College Students and the Method of Securing them.* Prepared from the Records of the Department of Hygiene and Physical Education in Amherst College during the years 1861–62 and 1892–93, inclusive. Third edition. Amherst, Mass. Carpenter and Morehouse. 1893, 8vo. 35 p. 3 tables.
103. JACKSON, W. A., JR. *Tables of the Anthropometric Measurements of the Williston Seminary Students (140 in Number), 1891–92.* The Willistonian, March 5, 1892. Easthampton, Mass., 1892. 3 tables.
104. LADD, CAROLYN C. *Physical Training in its Relation to the Health and Education of Women.* Report of the Proceedings of Fifteenth Annual Meeting of the Alumnæ Association of the Woman's Medical College of Pennsylvania, March 14, 1890. Philadelphia, 1890. 42–54.
105. MCNAIR, ANNA D. *Statistics of Work done in Bryn Mawr College Gymnasium.* Bryn Mawr, Pennsylvania. In press.

106. SARGENT, D. A. *Anthropometric Chart Showing the Relation of the Individual in Size, Strength, Symmetry, and Development to the Normal Standard*. Cambridge, Mass., 1886.
107. ——— *Anthropometric Chart Showing the Distribution of an American Community as to Physical Power and Proportions; also the Relation of the Individual in Size, Strength, Symmetry, and Development to the Normal Standard of the same Age*. Cambridge, Mass., 1893.
108. ——— *The Physical Proportions of the Typical Man*. Scribner's Magazine, July, 1887. Vol. ii. 3-17. Illustrated.
109. ——— *The Physical Characteristics of the Athlete*. Ibid. November, 1887. Vol. ii. 541-561. Illustrated.
110. SEAVER, J. W. *Anthropometric Table Arranged from the Measures of 2300 Students*. New Haven, 1889.
111. TOPINARD, P. *L'Anthropométrie aux États-Unis*. Revue d'Anthropologie. Paris, 1889. 3<sup>e</sup> S. Vol. iv. 337-345. A review of works by Hitchcock and Sargent.
112. TUCKERMAN, F. *Anthropometric Data Based upon Nearly 3000 Measurements Taken from Students*. Amherst, 1888. 1 pl. 8vo.
113. WOOD, M. ANNA. *Anthropometric Table, Arranged After the Method of Percentile Grades, of the Measurements of 1500 Wellesley College Students (Female)*. No date; no imprint.
114. ——— *Anthropometric Table, Compiled from the Measurements of 1100 Wellesley College Students (Female); Arranged According to Bodily Heights*. 1890. No imprint.
115. ——— *Six Comparative Tables Showing Records of Class Crews Receiving Training in Gymnasium and on the Lake; of Twenty Students Receiving Training in the Gymnasium; and of Twenty Students Receiving no Training in the Gymnasium*. Wellesley College. President's Report. Boston, 1893. 35-40.
116. ——— *Statistical Tables Concerning the Class of 1891 of Wellesley College, numbering 104 Women*. 16 p. 4to. No imprint.
117. ——— *Statistical Tables, Showing Certain Measurements of 40 Freshmen (Female) of Wellesley College, at the Beginning (November, 1891) and End (May, 1892) of Six Months of Gymnastic Training*. 1892. 7 p. 4to. No imprint.